

## Steps for Multiplying Rational Expressions:

1. Factor the numerators and denominators.
2. Cancel like factors. You can cancel within the fraction or cross cancel between fractions. Only in pairs. You cannot cancel factors that are both in the numerator or both in the denominator.
3. Multiply remaining factors in the numerators and remaining factors in the denominators.

**\*\*Don't forget to write restrictions.\*\***

**When dividing two rational expressions, multiply the dividend by the reciprocal and then follow the rules for multiplication. (That is, change division into multiplication and flip the second fraction.)**

**Developing Skills**

In 3–12, multiply and express each product in simplest form. In each case, list any values of the variables for which the fractions are not defined.

3.  $\frac{2}{3} \times \frac{3}{4}$

4.  $\frac{5}{7a} \cdot \frac{3a}{20}$

5.  $\frac{4y}{5x} \cdot \frac{x}{8y}$

6.  $\frac{3a}{5} \cdot \frac{10}{9a}$

7.  $\frac{b+1}{4} \cdot \frac{12}{5b+5}$

8.  $\frac{a^2-100}{3a} \cdot \frac{a^2}{2a-20}$

9.  $\frac{7y+21}{7y} \cdot \frac{3}{y^2-9}$

10.  $\frac{a^2-5a+4}{3a+6} \cdot \frac{2a+4}{a^2-16}$

11.  $\frac{2a+4}{6a} \cdot \frac{3a^2}{a^2+2a}$

12.  $\frac{6-2x}{x^2-9} \cdot \frac{15+5x}{4x}$

In 13–24, divide and express each quotient in simplest form. In each case, list any values of the variables for which the fractions are not defined.

13.  $\frac{3}{4} \div \frac{9}{20}$

14.  $\frac{12}{a} \div \frac{6}{4a}$

15.  $\frac{6b}{5c} \div \frac{3b}{10c}$

16.  $\frac{a^2}{8a} \div \frac{3a}{4}$

17.  $\frac{x-2}{3x} \div \frac{4x-8}{9}$

18.  $\frac{6y^2-3y}{3y} \div \frac{4y^2-1}{2}$

19.  $\frac{c^2-6c+9}{5c-15} \div \frac{c-3}{5}$

20.  $\frac{w^2-w}{5w} \div \frac{w^2-1}{5}$

21.  $\frac{4b+12}{b} \div (b+3)$

22.  $\frac{a^2+8a+15}{4a} \div (a+3)$

23.  $(2x+7) \div \frac{1}{2x^2+5x-7}$

24.  $(a^2-1) \div \frac{2a+2}{a}$